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IN THE CLAIMS

1. (Original) An upflow reactor for producing dihydroxy compounds, said upflow reactor comprising:

a vessel;

a catalyst bed disposed in said vessel; and

a reactant distribution/product collection system disposed in said vessel, said reactant distribution/product collection system comprising,

a distributor in fluid communication with an inlet through which reactants are introduced to said distributor, said distributor being disposed at a lower end of said vessel and comprising a perforation disposed in said distributor and a first screen disposed at said perforation in said distributor, and

a collector through which said product dihydroxy compound is removed, said collector being disposed at an upper end of said vessel and comprising a perforation disposed in said collector and a second screen disposed at said perforation in said collector.

2. (Original) The upflow reactor of Claim 1, further comprising an aggregate layer disposed at said lower end of said vessel to support said catalyst bed.

3. (Original) The upflow reactor of Claim 2, wherein said aggregate layer comprises silica sand, diatomaceous earth, ceramic balls, or a combination of the foregoing materials.

4. (Original) The upflow reactor of Claim 1, wherein said vessel comprises a vessel having a structural geometry that is substantially cylindrical, substantially parallelepiped, substantially spherical, or a combination thereof.

5. (Original) The upflow reactor of Claim 1, wherein said vessel further comprises a jacket disposed at an upper surface of said vessel.

6. (Original) The upflow reactor of Claim 1, wherein said catalyst bed comprises a cross-linked ion exchange resin catalyst.

7. (Original) The upflow reactor of Claim 1, wherein said distributor further comprises a plurality of perforated arms extending laterally from said perforated manifold.

8. (Original) The upflow reactor of Claim 7, wherein said perforated arms disposed at opposing ends of said manifold are shorter than said perforated arms disposed intermediate said opposing ends of said manifold.

9. (Original) The upflow reactor of Claim 1, wherein said collector further comprises a plurality of perforated arms extending laterally from said perforated manifold.

10. (Original) The upflow reactor of Claim 9, wherein said perforated arms disposed at opposing ends of said manifold are shorter than said perforated arms disposed intermediate said opposing ends of said manifold.

11. (Original) The upflow reactor of Claim 1, wherein said dihydroxy compound is a bisphenol.

12. (Original) The upflow reactor of Claim 11, wherein said bisphenol is 2,2-bis(4-hydroxyphenyl)propane.

13. (Original) A distributor for an upflow reactor, said distributor being disposed at a lower end of said upflow reactor and comprising:

a manifold in fluid communication with an inlet into which a reactant is received;

a perforation disposed in said manifold; and

a screen disposed at said perforation, said screen and said perforation being configured to allow said reactant to be communicated therethrough.

14. (Original) The distributor of Claim 13, further comprising a plurality of arms extending from said manifold.

15. (Original) The distributor of Claim 14, further comprising perforations disposed on said arms.

16. (Original) The distributor of Claim 14, wherein said arms disposed proximate opposing ends of said manifold are shorter than said arms disposed intermediate said opposing ends of said manifold.

17. (Original) A collector for an upflow reactor, said collector being disposed at an upper end of said upflow reactor and comprising:

a manifold;

a perforation disposed in said manifold; and

a screen disposed at said perforation, said screen and said perforation being configured to allow a product to be received in said manifold.

18. (Original) The collector of Claim 17, further comprising a product takeoff line disposed in fluid communication with said manifold.

19. (Original) The collector of Claim 17, further comprising a plurality of arms extending from said manifold.

20. (Original) The collector of Claim 19, wherein said arms disposed proximate opposing ends of said manifold are shorter than said arms disposed intermediate said opposing ends of said manifold.

21. (Original) A method for producing a dihydroxy compound in an upflow reactor, said method comprising:

introducing a reactant to a distributor at a lower end of said upflow reactor, said distributor having a plurality of screen-covered perforations disposed therein;

directing said reactant from said distributor upward through a catalyst bed; and

recovering said dihydroxy from an upper end of said upflow reactor.

22. (Original) The method of Claim 21, wherein said recovering of said dihydroxy compound comprises receiving said compound through a collector disposed at said upper end of said upflow reactor, said collector having a plurality of screen-covered perforations disposed therein.

23. (Original) The method of claim 21, wherein said dihydroxy compound is a bisphenol.

24. (Original) The method of claim 23, wherein said bisphenol is 2,2-bis(4-hydroxyphenyl)propane produced from a ketone and a phenol.

25. (Original) A method for reducing the amount of catalyst bead carryover from a bed of catalyst beads in an upflow reactor, said method comprising: receiving a product of said upflow reactor into a collector disposed at an upper end of said upflow reactor, said collector having a plurality of perforations with screens disposed over said perforations.

26. (Original) The method of Claim 25, wherein openings in said screens have diameters of about 2/5 to about one quarter the size of the minimum diameter of said catalyst beads in the reacting mixture.

27. (Original) The method of Claim 25, wherein openings in said screens have diameters of about one third the size of the minimum diameter of said catalyst beads in the reacting mixture.

28. (Original) A method for manufacturing a polycarbonate, said method comprising: reacting a dihydroxy compound with phosgene, a diphenyl carbonate, or a combination of phosgene and diphenyl carbonate, wherein said dihydroxy compound is manufactured with the apparatus of Claim 1.

29. (New) A method for manufacturing a dihydroxy compound, comprising:
introducing a ketone and a phenol to the bottom of an upflow reactor;
passing the ketone and phenol upward through the reactor to contact catalyst;
reacting the ketone and the phenol to product the dihydroxy compound; and
removing dihydroxy compound from an upper part of the reactor.

30. (New) The method of Claim 29, wherein the ketone comprises acetone.

31. (New) The method of Claim 30, wherein the dihydroxy compound is bisphenol A.

32. (New) The method of Claim 31, wherein the phenol is selected from the group consisting of ortho-cresol, meta-cresol, 2,6-dimethylphenol, ortho-sec-butylphenol, 1,3,5-xylenol, tetramethylphenol, 2-methyl-6-tertiary butylphenol, orthophenylphenol, ortho- and meta-chlorophenol, ortho-bromophenol, 2,6-dichlorophenol, and combinations of any of the foregoing phenols.

33. (New) The method of Claim 29, wherein the catalyst comprises an ion exchange resin comprising divinyl benzene crosslinking.

34. (New) The method of Claim 33, wherein the catalyst further comprises sulfonic acid functionality.

35. (New) The method of Claim 29, wherein a pressure drop across the upflow reactor is less than 1 bar at linear velocities of 0.050 cm/s to 0.100 cm/s.